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UTILITIES DEPARTMENT

TESTIMONY OF S. K. YOUNG

FOR

DUKE POWER COMPANY

PSCSC DOCKET NO. 98-003-E

1 Q. PLEASE STATE YOUR NAME, ADDRESS AND POSITION WITH DUKE POWER
2 COMPANY.

3 A. My name is Steven K. Young and my business address is 422 South Church Street,
4 Charlotte, North Carolina. I am Vice President, Rates and Regulatory Affairs of
5 Duke Power Company.

6 Q. STATE BRIEFLY YOUR EDUCATION, ACCOUNTING BACKGROUND AND
7 PROFESSIONAL AFFILIATIONS.

8 A. I am a graduate of the University of North Carolina with a Bachelor of Science in
9 Business Administration. I am a Certified Public Accountant and a Certified
10 Managerial Accountant, with memberships in the American Institute of Certified
11 Public Accountants, the Institute of Managerial Accountants and the National
12 Association of Accountants. I am also a member of the Edison Electric Institute
13 Economic Regulation and Competition Committee and the Southeastern Electric
14 Exchange Rate Committee.

15 Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND EXPERIENCE.

16 A. I began my employment with Duke in the Controller's Department in July, 1980, and
17 became Supervisor of the Catawba Interconnect Systems in May, 1986. In
18 November, 1988, I became Director of Catawba Accounting. In September, 1991, I
19 became Manager of Bulk Power Agreements in the System Planning and Operating
20 Department. In November, 1992, I became Manager of the Rate Department. I

RETURN DATE: OK AR
SERVICE: OK AR

1 assumed my current position as Vice President, Rates and Regulatory Affairs in
2 April, 1998.

3 Q. ARE YOU FAMILIAR WITH THE ACCOUNTING PROCEDURES AND BOOKS OF
4 ACCOUNT OF DUKE POWER COMPANY?

5 A. Yes. As ordered by this Commission, the books of account of Duke Power
6 Company follow the uniform classification of accounts prescribed by the Federal
7 Regulatory Commission.

8 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

9 A. The purpose of my testimony is as follows:

- 10 1. To summarize the Company's procedures in accounting for fuel.
- 11 2. To update the actual fuel cost data reviewed in these proceedings. Actual
12 fuel costs through March 1997 were presented in the last hearing. April
13 1997 through March 1998 actual fuel cost data is presented in Young
14 Exhibits 1 and 5 accompanying my testimony.
- 15 3. To summarize the performance of the Company's nuclear generating
16 system during the period March 1997 through February 1998.
- 17 4. To discuss the fuel recovery results for the period April 1997 through May
18 1998.
- 19 5. To provide and explain the Company's computations for the projected fuel
20 costs for the twelve-month period June 1998 through May 1999.

21 Q. MR. YOUNG, CAN YOU EXPLAIN HOW THE MONTHLY COAL COSTS
22 CHARGED TO EXPENSE ARE DERIVED?

23 A. All the Company's coal is delivered by rail. As coal is received at each plant, it is
24 weighed and sampled for quality verifications. Subsequently, the purchasing
25 department compares the weight, price and quality with the purchase order and

1 railroad waybill. Adjustments are made to the cost of coal purchased in those cases
2 where the quality of the coal received varies from contract specifications for BTU
3 (British Thermal Unit) and ash content.

4 Moisture and BTU tests are also made as the coal is delivered to the coal
5 bunkers for each boiler. BTU tests measure the energy content of the coal. To the
6 extent that the moisture content of the coal burned differs from the moisture content
7 of coal purchased, an adjustment is subsequently made to the inventory tonnage.
8 Wet coal weighs heavy and without the moisture adjustment, tons burned would be
9 overstated and inventory would be understated.

10 Coal costs charged to expense are calculated on an individual plant basis.
11 The expense charge is the product of the tons of coal conveyed to the bunkers for a
12 generating unit during the month times the average cost of the coal. The number of
13 tons is determined by using scales located on the conveyor belt running to the unit's
14 coal bunkers. The average cost reflects the total cost of coal on hand as of the
15 beginning of the month, computed using the moving average inventory method, plus
16 the cost of coal delivered to the plant during the month. The cost of coal is
17 determined from the invoice for the coal and the freight bill and does not include any
18 nonfuel cost or coal handling cost at the generating station.

19 Physical inventories using aerial surveys are conducted annually. Two
20 adjustments to book inventory were made in 1997 based on aerial surveys
21 conducted in December 1996 and October 1997.

22 Q. PLEASE DISCUSS THE PERFORMANCE OF DUKE POWER COMPANY'S
23 FOSSIL GENERATING SYSTEM.

24 A. In 1997 the fossil steam generating plants provided 50% of total generation. The
25 heat rate for the fossil coal system was 9343 BTU, a slight improvement from the

1 previous year. A low heat rate indicates that the generating system is using less
2 heat energy from fuel to generate electrical energy.

3 Q. PLEASE EXPLAIN HOW MONTHLY NUCLEAR COSTS CHARGED TO
4 EXPENSE ARE DERIVED.

5 A. Nuclear fuel expense for the month is based on the energy output in Mbtus of each
6 fuel assembly in the core, nuclear fuel disposal costs and the DOE Decontamination
7 and Decommissioning Fund Fee.

8 The cost of each fuel assembly is determined when the fuel is loaded in the
9 reactor. The costs include yellowcake (uranium), conversion, enrichment and
10 fabrication. An estimate of the energy content of each fuel assembly is also made.
11 A cost per Mbtu is determined by dividing the cost of the assembly by its expected
12 energy output. Each month an engineering calculation of the Mbtu output of an
13 assembly is priced at its cost per Mbtu.

14 During the life of a fuel assembly, the expected energy output may change
15 as a result of actual plant operations. When this occurs, changes are made in the
16 cost per Mbtu for the remaining energy output of the assembly. New fuel assembly
17 orders are planned for either a sixteen or eighteen month cycle. The length of a
18 cycle is the duration of time between when a unit starts up after refueling and when
19 it starts up after its next refueling. During a refueling approximately one-third of the
20 fuel in the reactor is replaced.

21 Q. WERE YOUNG EXHIBITS 1 THROUGH 6 PREPARED BY YOU OR AT YOUR
22 DIRECTION AND UNDER YOUR SUPERVISION?

23 A. Yes. Each of these exhibits was prepared at my direction and under my
24 supervision.

1 Q. MR. YOUNG, WHAT IS THE MAGNITUDE OF THE COMPANY'S MONTHLY FUEL
2 COSTS?

3 A. Young Exhibit 1 sets forth the total system actual fuel costs (as burned) that the
4 Company incurred from April 1997 through March 1998. This exhibit also shows
5 fuel costs by type of generation and total MWH generated during this period. The
6 oil and gas usage was for light-off fuel used to start up our coal plants and for
7 combustion turbine generation. The monthly fluctuations in total fuel cost during this
8 period are primarily due to refueling and other outages at the nuclear stations,
9 weather sensitive sales and the availability of hydro generation.

10 Q. MR. YOUNG, WHAT IS THE MAGNITUDE OF THE COMPANY'S FUEL COST
11 COMPARED TO THE TOTAL COST OF SERVICE?

12 A. Fuel costs continue to be the largest cost item incurred in providing electric service.
13 For the twelve months ended February 1998, fuel and the fuel component of
14 purchased power represented approximately 18% of the Company's total revenue.
15 Coal costs are the largest fuel cost component and during the period April 1997
16 through March 1998 comprised approximately 70% of the Company's fuel bill.

17 Q. MR. YOUNG, WHAT HAS HAPPENED TO THE UNIT COST OF FUEL DURING
18 RECENT REPORTING PERIODS?

19 A. Young Exhibits 2A and 2B graphically portray the "as burned" cost of both coal and
20 nuclear fuel in cents per million BTU (MBTU) for the twelve month periods ending
21 January 1996 through March 1998. As Exhibit 2A shows, coal costs have trended
22 downward somewhat during this period. The trend of coal prices reflects price
23 reductions resulting from contract re-negotiations as well as an increase in
24 purchases in the spot market as our total needs increased with growth. Exhibit 2B
25 shows that nuclear fuel costs have also trended down slightly.

1 While the unit costs of each type of fuel have shown little volatility in the
2 recent past, we can expect our composite cost of fuel to increase. Our future KWH
3 growth will be met primarily from the Company's coal generating units and the cost
4 of coal is about three times the cost of nuclear fuel.

5 Q. MR. YOUNG, WHAT DOES YOUNG EXHIBIT 3 SHOW?

6 A. Young Exhibit 3 graphically shows generation by type for the current and projected
7 test periods as well as three prior periods.

8 Q. MR. YOUNG, WOULD YOU PLEASE DISCUSS THE PERFORMANCE OF THE
9 COMPANY'S NUCLEAR GENERATING SYSTEM DURING THE PERIOD MARCH
10 1997 THROUGH FEBRUARY 1998?

11 A. Young Exhibit 4 sets forth the achieved nuclear capacity factor for the period April
12 1997 through March 1998 based on the criteria set forth in Section 58-27-865, Code
13 of Laws of South Carolina as amended in 1996. The statute states as follows:

14 There shall be a rebuttable presumption that an electrical
15 utility made every reasonable effort to minimize cost
16 associated with the operation of its nuclear generation facility
17 or system, as applicable, if the utility achieved a net capacity
18 factor of ninety-two and one-half percent or higher during the
19 period under review. The calculation of the net capacity
20 factor shall exclude reasonable outage time

21 As shown on page 1 of Young Exhibit 4, the Company's achieved capacity
22 factor reflecting reasonable outage time (as set forth in § 58-27-865) was greater
23 than 92.5% for the current period.

24 With the refueling requirements, maintenance requirements, Nuclear
25 Regulatory Commission (NRC) operating requirements, and the complexity of
26 operating nuclear generating units our system will nearly always have the equivalent
27 of at least one nuclear unit out of service. Pages 2 and 3 of Young Exhibit 4 show

1 the dates of and explanations for actual and forecast outages of a week or more in
2 duration.

3 Q. MR. YOUNG, DO YOU BELIEVE THE COMPANY'S ACTUAL FUEL COSTS
4 INCURRED DURING THE PERIOD APRIL 1997 THROUGH MARCH 1998 WERE
5 REASONABLE?

6 A. Yes. I believe the costs are reasonable and meet the guideline test set forth in
7 Section 58-27-865(F) of the Code of Laws of South Carolina. They also reflect the
8 Company's continuing efforts to maintain reliable service and an economical
9 generation mix, thereby minimizing the total cost of providing service to our South
10 Carolina retail customers.

11 Q. WHAT FUEL FACTORS HAS THIS COMMISSION APPROVED IN THE PAST?

12 A. The following table shows the approved factors since 1979, when the current fuel
13 clause procedure began:

14	<u>Period</u>	<u>Periods</u>	<u>¢/KWH</u>
15	June 1979 - May 1980	2	1.3500
16	June 1980 - May 1981	2	1.2250
17	June 1981 - November 1981	1	1.5000
18	December 1981 - May 1982	1	1.5750
19	June 1982 - November 1982	1	1.6500
20	December 1982 - May 1983	1	1.6000
21	June 1983 - May 1984	2	1.3750
22	March 1984		1.0500
23	June 1984 - November 1984	1	1.1250
24	December 1984 - November 1985	2	1.2500
25	October 1985		1.1199
26	December 1985 - November 1986	2	1.1199
27	November 1986		0.9806
28	December 1986 - May 1987	1	0.9806
29	June 1987 - November 1987	1	1.1500
30	December 1987 - November 1988	2	1.2500
31	December 1988 - November 1989	2	1.0750
32	December 1989 - May 1990	1	1.0500
33	June 1990 - November 1990	1	1.0000
34	December 1990 - November 1991	2	1.1000
35	December 1991 - May 1992	1	1.0000
36	June 1992 - November 1993	3	0.9500
37	December 1993 - May 1998	8	1.0000

1 Q. WHAT HAS BEEN THE COMPANY'S FUEL RECOVERY EXPERIENCE DURING
2 THE PERIOD APRIL 1997 THROUGH MARCH 1998?

3 A. Young Exhibit 5 shows the actual fuel costs incurred for the period April 1997
4 through March 1998, the estimated fuel costs for April and May 1998 and the
5 under-recovery carried forward at the beginning of the period. This exhibit
6 compares the fuel costs incurred with the fuel rate being collected. The Company
7 started the period under-recovered by \$13,300,000 as shown on line 11, and as
8 shown on line 12, the Company is projecting an over-recovery at the end of the
9 period of \$3,473,000.

10 Q. MR. YOUNG, WHAT IS THE COST OF FUEL THE COMPANY PROJECTS FOR
11 RECOVERY DURING THE PERIOD JUNE 1998 THROUGH MAY 1999?

12 A. Young Exhibit 6 sets forth projected fuel costs for the period June 1998 through May
13 1999. As shown on line 7, the fuel cost estimated for recovery during this period is
14 1.0238¢/KWH. After adjusting for the cumulative over-recovery, the adjusted fuel
15 cost is 1.0083¢/KWH.

16 Q. WHAT WAS THE BASIS FOR ESTIMATING FUEL COSTS AS SHOWN ON
17 YOUNG EXHIBIT 6?

18 A. The latest available information was used to develop the projections shown on
19 Young Exhibit 6. The projected KWH sales on line 6 are from the Company's 1997
20 sales forecast. Projected nuclear generation reflects planned refueling outages and
21 a 95% capacity factor while the units are running. The most recent nuclear fuel cost
22 estimate was used to determine projected nuclear fuel expense. Estimated hydro
23 generation for the period is based on median generation for the period 1967 - 1997.
24 The median hydro generation for each calendar month is determined by selecting
25 the value of generation for that calendar month that is greater than the generation

1 values for that calendar month during 15 years of a 31 year (1967 - 1997) period
2 and less than the generation values for that calendar month during 15 years of the
3 same 31 year period.

4 Q. MR. YOUNG, WHAT FUEL FACTOR IS THE COMPANY PROPOSING FOR
5 INCLUSION IN BASE RATES EFFECTIVE JUNE 1, 1998?

6 A. The Company proposes that a fuel factor of 1.000¢/KWH continue to be reflected
7 in base rates for the period June 1, 1998 through May 30, 1999. Based on our
8 estimate, this fuel factor would allow the Company to recover most of its fuel costs
9 incurred during the period June 1998 through May 1999, resulting in a slight under-
10 recovery at the end of the period. This factor balances out over/under-recoveries of
11 fuel costs over time and is in keeping with the spirit of the statute which allows
12 utilities to recover prudently incurred fuel costs "in a manner that tends to ensure
13 public confidence and minimize abrupt changes in charges to consumers."

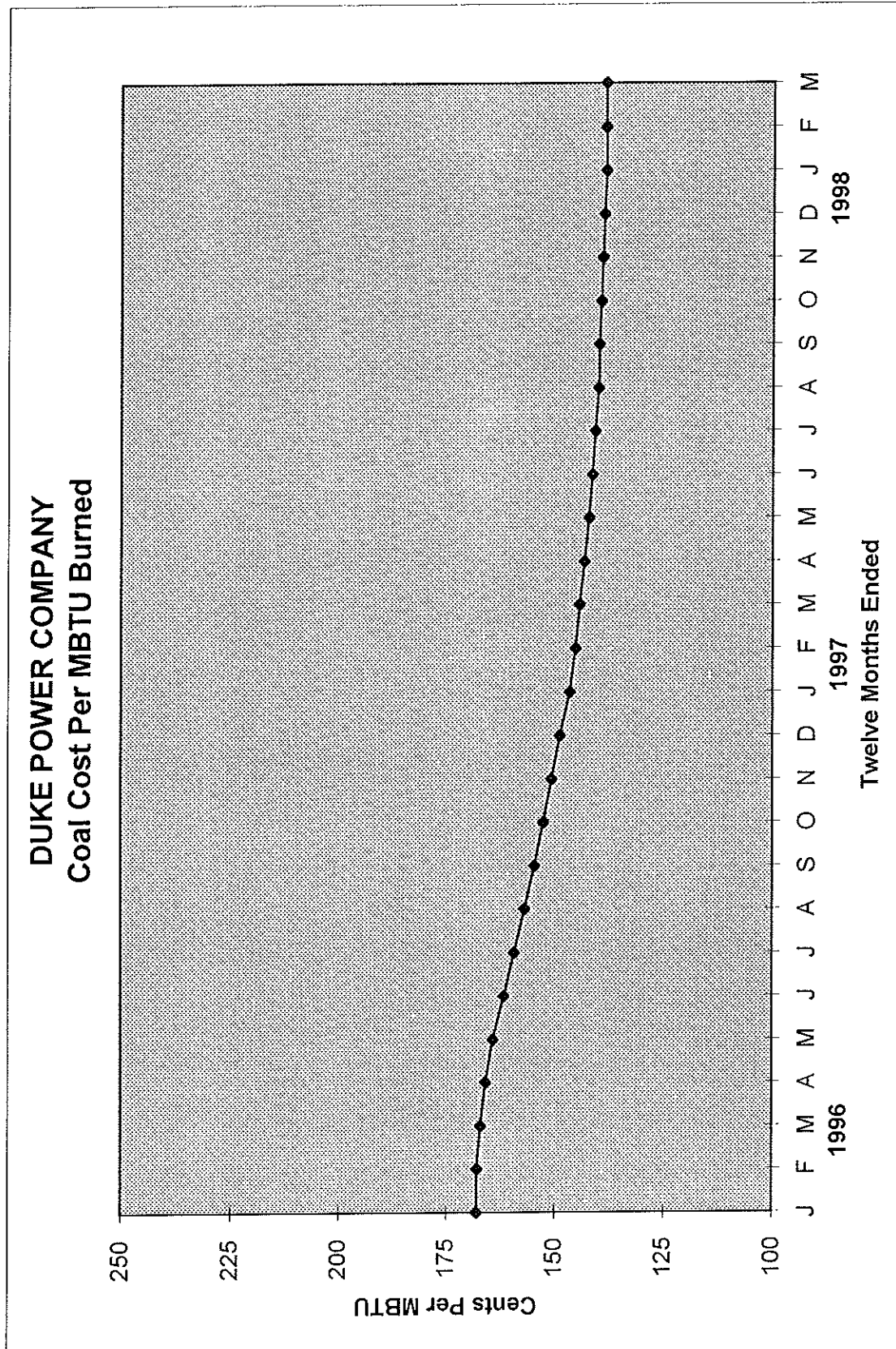
14 Q. MR. YOUNG, DOES THAT CONCLUDE YOUR TESTIMONY?

15 A. Yes, it does.

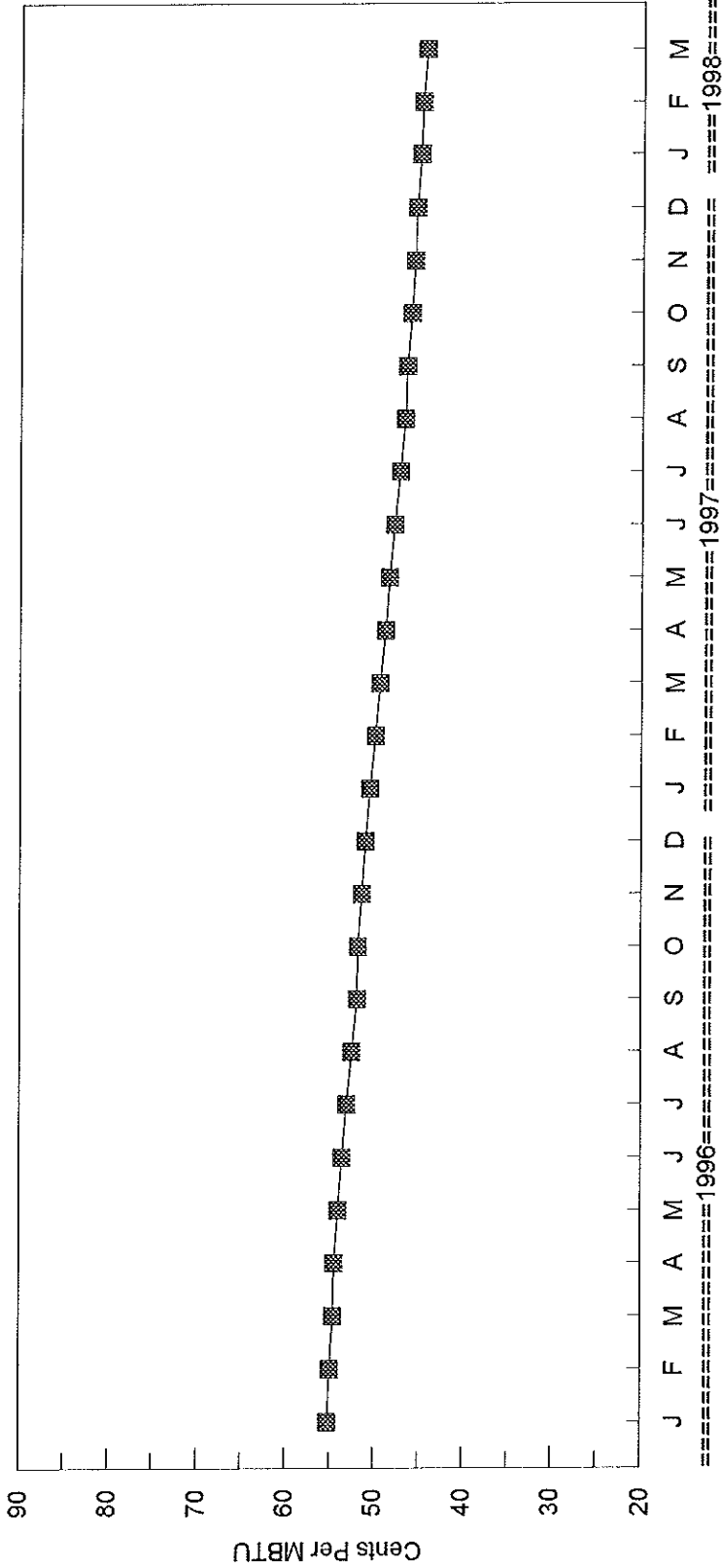
YOUNG EXHIBIT 1

DUKE POWER COMPANY
 SOUTH CAROLINA FUEL CLAUSE
 1998 ANNUAL FUEL HEARING
 TOTAL COMPANY FUEL COST
 \$000

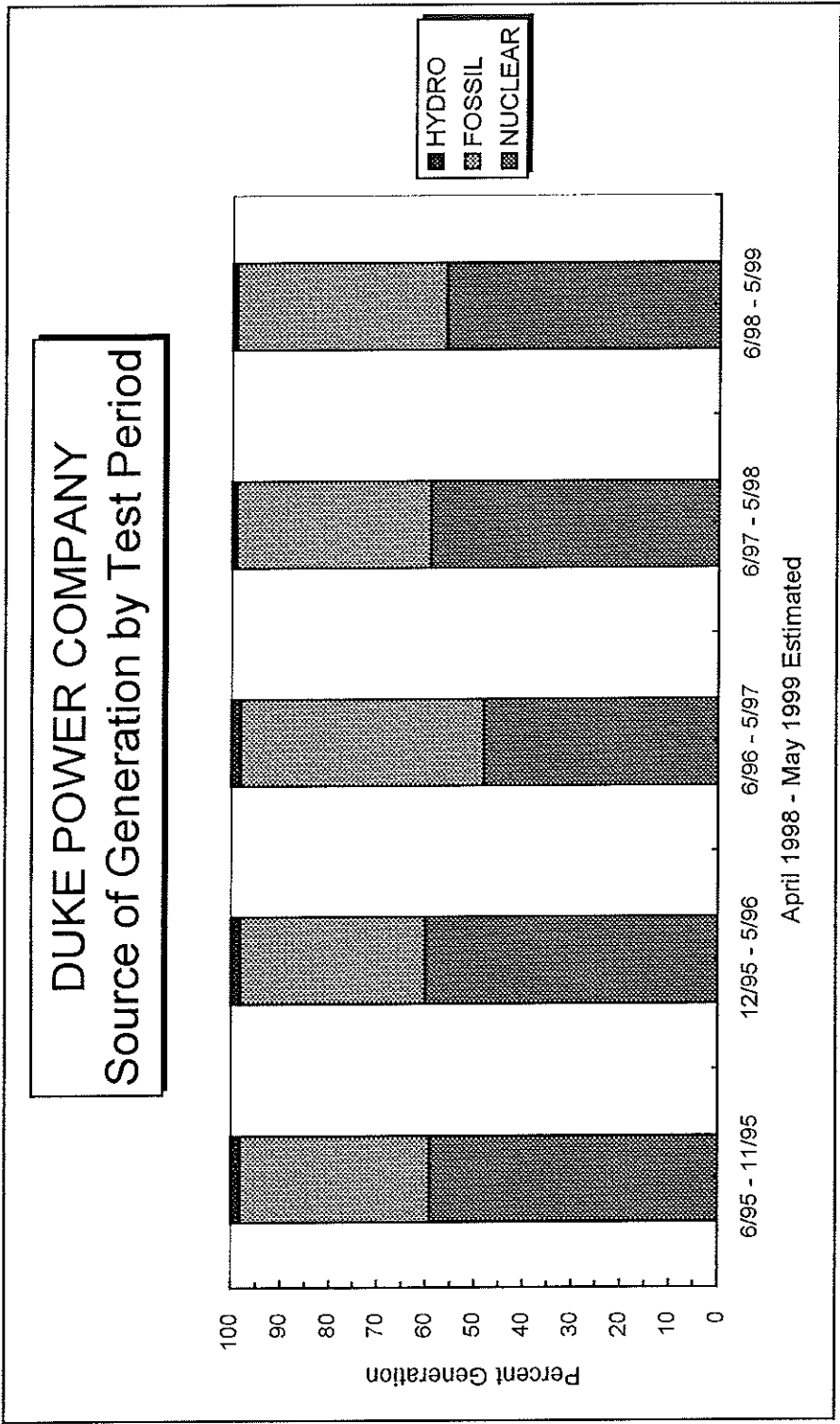
Line No.	Description	Mo. Avg. 12Mo. 3/97	April 1997	May 1997	June 1997	July 1997	Aug. 1997	Sept. 1997	Oct. 1997	Nov. 1997	Dec. 1997	Jan. 1998	Feb. 1998	March 1998
1	Coal	\$49,200	\$46,084	\$42,206	\$42,737	\$59,021	\$51,117	\$45,557	\$50,783	\$51,569	\$58,067	\$40,396	\$30,790	\$38,605
2	Oil	524	433	246	611	573	396	310	266	634	880	365	349	587
3	Gas	396	137	243	1,952	5,088	1,192	788	1,106	195	22	40	(5)	18
4	Nuclear	12,561	10,796	9,749	12,141	14,122	16,508	14,100	11,448	10,179	11,399	14,072	13,073	15,012
5	Total	\$62,681	\$57,450	\$52,444	\$57,441	\$78,804	\$69,213	\$60,755	\$63,603	\$62,577	\$70,368	\$54,873	\$44,207	\$54,222
6	MWH Gen.	7,337,480	5,979,487	5,221,134	5,904,497	7,470,324	7,498,978	6,273,105	6,104,678	6,103,103	7,023,268	6,403,274	5,397,784	6,343,404



DUKE POWER COMPANY
Nuclear Cost Per MBTU Burned



12 Months Ended



DUKE POWER COMPANY
SOUTH CAROLINA FUEL CLAUSE
1998 ANNUAL FUEL HEARING
NUCLEAR PLANT PERFORMANCE
CAPACITY FACTOR 4/97 - 3/98

YOUNG EXHIBIT 4
Page 1 of 3

1	Nuclear System Actual Net Generation During Test Period	48,510,143 MWH
2	Total Number of Hours During Test Period	8,760
3	Nuclear System MDC During Test Period	7,039.7 MW
4	Reasonable Nuclear System Reductions	13,873,804 MWH
5	Nuclear System Capacity Factor $[1/((2 * 3) - 4)] * 100$	<u>101.50</u> %

Note:

MDC reflects McGuire @ 1129 MW for 6600 hours
and @ 1100 MW for 2160 hours

DUKE POWER COMPANY
SOUTH CAROLINA FUEL CLAUSE
1998 ANNUAL FUEL HEARING
NUCLEAR PLANT PERFORMANCE

Nuclear Outages Lasting One Week Or More - Current Period

<u>Unit</u>	<u>Date of Outage</u>	<u>Explanation of Outage</u>
Oconee 1	3/28/97 - 4/11/97	Alignment and balance performed on 1A1 reactor coolant pump
	6/13/97 - 7/3/97	Required inspection of high pressure injection piping thermal shield
	9/18/97 - 12/24/97	Refueling - EOC 17 and repairs & modifications
	12/28/97 - 2/11/98	Steam generator leak, control rod drive failure and surge line drain line weld failure
Oconee 2	4/22/97 - 5/24/97	Non-isolatable reactor coolant system leak due to crack in high pressure injection piping due to loose thermal sleeve
	3/13/98 - 3/31/98	Began refueling - EOC 16
Oconee 3	5/2/97 - 6/1/97	Inspection & repair of high pressure injection piping thermal sleeve and repair 2 damaged high pressure injection pumps
	6/24/97 - 7/5/97	Generator seal oil problems due to cocked seal in generator
	9/27/97 - 10/11/97	Replace failed 3B reactor building cooling unit
McGuire 1	2/14/97 - 5/20/97	Refueling - EOC 11 and steam generator replacement
McGuire 2	6/14/97 - 6/29/97	Steam generator tube leak
	7/11/97 - 7/22/97	Reactor trip due to reactor coolant pump motor failure
	10/3/97 - 12/18/97	Refueling - EOC 11 and steam generator replacement
Catawba 1	11/28/97 - 1/6/98	Refueling - EOC 10
Catawba 2	3/21/97 - 5/3/97	Refueling - EOC 8

DUKE POWER COMPANY
SOUTH CAROLINA FUEL CLAUSE
1998 ANNUAL FUEL HEARING
NUCLEAR PLANT PERFORMANCE

Nuclear Outages Lasting One Week Or More - Forecast Period

<u>Unit</u>	<u>Date of Outage</u>	<u>Explanation of Outage</u>
Oconee 3	9/10/98 - 10/25/98	Refueling - EOC 17
McGuire 1	6/1/98 - 7/3/98	Refueling - EOC 12
McGuire 2	2/12/99 - 3/19/99	Refueling - EOC 12
Catawba 1	4/9/99 - 5/14/99	Refueling - EOC 11
Catawba 2	10/3/98 - 11/17/98	Refueling - EOC 9

YOUNG EXHIBIT 5

DUKE POWER COMPANY
 SOUTH CAROLINA FUEL CLAUSE
 1998 ANNUAL FUEL HEARING
 CURRENT PERIOD FUEL COSTS INCURRED
 \$000

Line No.	Item	April 1997	May 1997	June 1997	July 1997	Aug. 1997	Sept. 1997	Oct. 1997	Nov. 1997	Dec. 1997	Jan. 1998	Feb. 1998	March 1998	April 1998	May 1998
1	Fossil Fuel	\$46,654	\$42,695	\$45,300	\$64,682	\$52,705	\$46,655	\$52,155	\$52,398	\$58,969	\$40,801	\$31,134	\$39,210	\$31,761	\$38,660
2	Nuclear Fuel	10,796	9,749	12,141	14,122	16,508	14,100	11,448	10,179	11,399	14,072	13,073	15,012	15,548	16,043
3	Fuel In Purchases	1,349	5,021	8,477	5,900	2,499	5,169	3,455	3,249	2,318	1,214	2,457	2,735	3,436	3,479
4	Fuel In Intersystem Sales	<u>6,205</u>	<u>2,106</u>	<u>3,886</u>	<u>8,573</u>	<u>6,465</u>	<u>5,942</u>	<u>8,214</u>	<u>6,658</u>	<u>3,777</u>	<u>2,864</u>	<u>3,547</u>	<u>9,221</u>	<u>5,622</u>	<u>5,622</u>
5	Total Costs	\$52,594	\$55,359	\$62,032	\$76,131	\$65,247	\$59,982	\$58,844	\$59,168	\$68,909	\$53,223	\$43,117	\$47,736	\$45,123	\$52,560
6	MW/H Sales	5,612,970	5,369,130	6,052,342	6,822,697	7,143,523	6,810,329	5,570,611	5,745,534	6,590,128	6,459,613	6,035,145	5,847,727	5,493,984	5,482,441
7	Fuel Cost ¢/KWH	0.9370	1.0311	1.0249	1.1158	0.9134	0.8808	1.0563	1.0298	1.0456	0.8239	0.7144	0.8163	0.8213	0.9587
8	¢/KWH Billed	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9	SC Retail MW/H Sales	1,650,676	1,659,401	1,771,393	1,947,570	2,089,877	1,996,997	1,667,722	1,697,758	1,783,242	2,871,104	1,740,050	1,742,757	1,719,155	1,728,226
10	\$ (Over) Under	(\$1,040)	\$516	\$441	\$2,255	(\$1,810)	(\$2,380)	\$939	\$506	\$813	(\$5,056)	(\$4,970)	(\$3,201)	(\$3,072)	(\$714)
11	Prior Period (Over) Under	<u>13,300</u>													
12	Cumulative (Over) Under	\$12,260	\$12,776	\$13,217	\$15,472	\$13,662	\$11,282	\$12,221	\$12,727	\$13,540	\$8,484	\$3,514	\$313	(\$2,759)	(\$3,473)

[illegible]